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ABSTRACT

This paper attempts to certify that certain changes in voicing and aspiration, namely the shift from Kan'on to Go'on, occurred during the proto-Japanese period. Based on Middle Chinese data, proto-Korean-Japanese systems, Tibetan transcriptions of Chinese texts, and internal Japanese evidence, the authors date the transition roughly in the 7th century. A bibliography of referneces is included. (DD)

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Evidence of a Consonant Shift in 7th Century Japanese

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Asayama 1943 and Hamada 1952 form the foundation for this paper; those monographs are summarized in English in Miller 1967:220f. Briefly, it appears that all voiced obstruents from Old Japanese (OJ) up to the Muromachi Period were prenasalized: voiced obstruents never occurred word-initially, and a fair number of them can be shown to result from strings of the shape

{m, n} + V + {p, t, k, s}

through syncope and progressive voicing assimilation; e.g., murazi, a Nara Period title, < mura "village, group" + nusi "owner." If all such obstruents could be shown to be similarly derived, their non-occurrence in word-initial position and their nasal onsets would require no special explanation. The ubiquity of the postpositions no and ni certainly encourages speculation in this direction. In fact, we suspect future research to uncover other sources for surface voiced obstruents (see below regarding pitch-accent in OJ); but even so, cases of the type just mentioned are already well enough attested to cast doubt on the necessity of postulating single underlying segments for any OJ voiced obstruents.

The question naturally arises: if OJ [b, d, g, z] do not come from /b, d, g, z/, did [b, d, g, z] < /b, d, g, z/ ever exist in pre-OJ? In this connection, we note that evidence from Korean (Martin 1966), "the other Altaic languages" (Miller 1971), and various modern Japanese dialects (Martin, personal communication), especially in the Ryūkyū subgroup, shows that main-island [w-] and [y-] must go back to proto-J labial and dental voiced obstruents of some sort or other; more recently, Martin (1972) has revised his reconstruction of proto-Korean-Japanese by proposing the correspondence

*g- : Korean k- : Japanese Ø-.

Now, a considerable part of what we know about OJ phonology is based on a comparison of Japanese data with our relatively more extensive knowledge of Middle Chinese (MC) phonology (cf. Lange 1968). In light of such cross-genetic comparison, the phonological differences between Go'on 呉音 and Kan'on 漢音 are particularly revealing

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since these two groups of Chinese loanwords reflect MC systems from different times and locales. Preparatory to advancing our argument regarding OJ voiced obstruents, we shall show, first, that both the MC dialects in question had in common a series of voiced obstruents, and then, that the dialect upon which the Kan'on was based had developed a distinctive series of occluded nasal initials.

We shall follow Pulleyblank 1968, 1970 and 1971 in claiming that Go'on was based on the language of the Qiè-yùn 切韻 of 601, i.e., on "the 'standard Mandarin' of the Northern and Southern Dynasties," most likely the educated court speech of Nán-jīng during the 6th century (1970:204). We take this position even though we agree with Hashimoto 1965 that certain elements of the Qiè-yùn phonological system (irrelevant for the discussion that follows) reflect no real language, but rather a "diasystem" which reconciles dialect divergences. Since the Táng Dynasty monk Huì Lín 慧琳 referred to the Qiè-yùn standard as Wú 吳 pronunciation (Pulleyblank 1968:4), there can be little doubt as to the essential meaning of the term Go'on.

Kan'on, according to Miller 1967:103, was "the Chinese language of Cháng-ān at the peak of the Táng Dynasty, as it reached Japan, mutatis mutandis, from the end of the seventh and into the eighth century." Thus, the arrival of Kan'on virtually coincides with the beginning of the OJ Period.

We now turn to the disputed matters of voicing and aspiration in MC. Karlgren postulated three obstruent series for the language of the Qiè-yùn: voiced aspirate, voiceless non-aspirate, and voiceless aspirate. As proof of the validity of the voiced aspirates, he adduced the voicing of Go'on and Wú dialects, and the aspiration of Mandarin and Hakka.

In 1953, Martin phonemicized Karlgren's phonetic scheme and analyzed his velar fricatives [ɣ] and [x] as /h̄/ and /h/ respectively. Martin then re-interpreted Karlgren's three series as phoneme sequences /ph̄/, /p/, and /ph/. It is well to keep in mind that Martin did not adduce additional evidence to support his analysis, but rather arrived at his conclusions solely by examining Karlgren's data from phonemic premises (7f). This analysis has the desirable effect of minimizing the number of phonemes in the system.

Pulleyblank (1970, 1971), however, has explicitly rejected it, claiming that the "voiced aspirates" were in fact voiced at the time of the Qiè-yùn. Nonetheless, he adopts an analysis similar to Martin's for the 8th century Cháng-ān dialect by setting up /ph̄/-type phoneme sequences for the "voiced aspirate series." This analysis

was obviously not motivated by phoneme economy since Pulleyblank gives the voiceless aspirates phoneme status (/p'/) instead of treating them as /ph/-type clusters. Citing as evidence Kan'on and Tibetan transcriptions, Pulleyblank insists that the 8th century is the earliest time from which we have any proof of loss of voicing in MC; in support of his /-ɦ/, he cites the fact that Sanskrit voiced aspirates were transcribed during this period by MC "voiced aspirates."

As far as Karlgren's work is concerned, we take issue only with the plausibility of reconstructing voiced aspirates when no voiced non-aspirates seem to occur. Karlgren himself admitted that this "seems strange," but claimed that Old Chinese (OC) had had four series of obstruents, and that MC had simply dropped one of them (1954:221). LĬ Fāng-guì (1971), however, has convincingly shown that there is no justification for two series of voiced obstruents in OC (4f). LĬ calls for one series of voiced obstruents in both OC and MC, and, though he gives no reason for not reconstructing aspiration in this case, we agree with him that only voicing was phonemic.

Recent work in acoustic phonetics has shown that what have traditionally been called voicing and aspiration are articulatorily both on the same feature continuum, <u>voice onset time</u> (VOT). This refers to the coördination of the state of the glottis with obstruent release; a voiced stop, a voiceless unaspirated stop, and a voiceless aspirated stop differ according to the point at which voicing commences (Abercrombie 1967:148). We have, then, in MC three obstruent series all differing as to the feature VOT. It is important that the "aspiration" Karlgren reconstructs for the voiced stops not be confused with the aspiration of the voiceless obstruents on the VOT dimension. The "aspiration" of voiced stops such as is found in many languages of India is characterized by a following vowel pronounced with "breathy voice," and such stops are <u>not</u> part of the VOT scale (Abercrombie 1967:149). Moreover, Lisker and Abramson (1971) show that "VOT is <u>the single most effective measure</u> whereby homorganic stop categories in languages generally may be distinguished physically and perceptually." It is unlikely that obstruents already distinguished by this "single most effective measure" would have the added burden of one more <u>distinctive</u> feature.

We therefore find ourselves in agreement with Hashimoto 1965:233ff: the "aspiration" of MC voiced obstruents should be regarded as a concomitant feature. In phonological systems which have obstruent series of the shape

/b, p, ph/, /b/ often seems to have a concomitant "breathy register offset." Thus, at least one authority on Chinese phonetics reports Karlgren's alleged "voiced aspirates" in modern Wú dialects as voiced obstruents followed by vowels with breathy quality (Stimson, personal communication). This is exactly the description applied to the "voiced aspirates" of Pú-chí and Tōng-chéng by Zhào Yuán-rèn et al. 1947:1237, 1302 (see following chart). What we wish to claim here (and later research more fully) is that in such instances of non-distinctive breathy voice following voiced obstruents, the change in register is perceived as phonetically close to true aspiration, and therefore tends to play a rôle in phonemic change along the VOT dimension. In other words, we claim that the "aspiration" of the MC voiced obstruent series was at most a phonetic detail which in some cases may have influenced phonemic restructuring.

It should now be clear that the real obstacles to our first preparatory claim lie in the analyses of Martin and Pulleyblank. We shall therefore attempt to refute both of them.

Martin's phonemic solution rests crucially on the fact that, at the time of the Qiè-yùn, there were two velar fricatives. Since [ɣ] and [x] differed only in voice, it is claimed that they merged by the general devoicing rule relating MC to Mandarin; following Hockett's phonemicization of Modern Mandarin, in which the aspirate series is treated as a sequence (/ph/), Martin cites the devoicing rule as support for his argument (1953:16). This solution, however, proves to be untenable once we bring various non-standard Mandarin dialects into consideration. Below are listed the outcomes of crucial MC phonemes in some southeastern Hú-běi dialects (Zhào et al., 1947):

MC / Dialects	ɣ			x			b*	p	ph
Dà-yě 大冶	x	ɸ		x	ɸ		p'	p	p'
Xián-níng 咸寧	x	ɸ	f	x	ɸ	f	p'	p	p'
Yáng-xīn 陽新	x	ɕ		x	ɸ		p'	p	p'
Chóng-yáng 崇陽	x	ɸ	f	x	ɸ	f	p'	p	p'

Pú-chí 蒲圻	h**	φ	f	h	ç	f	b'	p	b'
Tōng-chéng 通城	h	φ	f	h	φ	f	b'	p	b'
Tōng-shān 通山	x	φ	f	x	ç	f	p	p	p'

* In all these dialects, the outcome of MC /b/ is not conditioned by tone.

** [h] has fricative quality, but Zhào et al. did not consider it quite enough to call it [x].

If we assume, as Martin did, that the MC initials were clusters such as /pH/ and /ph/, then we would expect the development of /H/ and /h/ to govern the development of those initials. The fact that they do not rules out the possibility of such clusters. In particular, notice that the two dialects which preserve voicing, Pú-chí and Tōng-chéng, have only a voiceless velar fricative just as in standard Mandarin; for these dialects, Martin's analysis is impossible. (The same can be said for Pulleyblank's scheme.)

Also, it is fairly certain that Martin's treatment of the "voiced aspirates" as unvoiced stop + /H/ is phonetically inaccurate. We know this because of the many Chinese transcriptions of Buddhist texts made during the 6th century in which both kinds of Sanskrit voiced obstruent (aspirate and non-aspirate) were rendered with the Chinese voiced initial series. It is inconceivable that both Sanskrit obstruent series would have been so transliterated if the Chinese series had not been voiced (cf. Zhào Yìn-táng 1957:6f for the Sanskrit data).

Turning now to Pulleyblank's phonetic arguments, we note that his claim for the devoicing of the voiced MC initials in the 8th century Cháng-ān dialect is based on the facts that 1) the corresponding Kan'on initials are not voiced, and 2) that Tibetan transcriptions sometimes render the MC initials as unvoiced. First of all, he is ignoring the fact that neither fǎn-qiè 反切 spellings nor the děng-yùn 等韻 tables record any differences as to the features of voicing or aspiration for these initials between the time of the Qiè-yùn and the 8th century. There should be no reason for orthographic conservatism here because Pulleyblank claims that the standard language had changed. Furthermore, transcriptions of Sanskrit texts continued to have the Sanskrit

voiced aspirates rendered with MC voiced initials. It is true that the voiced unaspirates were now transcribed with MC nasal initials rather than with voiced obstruent initials, but we will presently see the reasons for this change. In any case, Pulleyblank has decided to overlook this Sanskrit evidence for voicing since he believes it is outweighed by the Kan'on and Tibetan data.

There are, as a matter of fact, five Tibetan transcriptions of Chinese texts which date from the 8th and 9th centuries. Pulleyblank bases his claims about these transcriptions on a 1933 monograph of Luó Cháng-péi and a more recent study done by B. Csongor (1960). Hashimoto 1965 notes crucial mistakes in these two works and corrects them (90ff). He then reorganizes the glossaries and provides separate tables for each of the five different sources (175ff). The separation of the tables is especially important because only then are certain regularities readily apparent. We see that four of the sources transcribe "voiced aspirate" stops with Tibetan voiced stops. Only one of the sources uses aspirated stops, and it does not do so consistently. The Tibetan evidence, therefore, does not support Pulleyblank's claim; indeed, it militates strongly against it.

Only the Kan'on seems to support Pulleyblank. But if we accept the Kan'on as proof that the Cháng-ān dialect had already undergone devoicing by the 8th century, this contradicts the fǎn-qiè, the děng-yùn tables, the Sanskrit evidence, and the Tibetan attestations. We are forced to conclude that the differences between Go'on and Kan'on as to initial consonant voicing did not reflect a change that took place in MC, but rather one that was internal to Japanese.

We now come to our second preparatory claim. Maspéro 1920 was probably the first to notice that Sanskrit voiced non-aspirates after the 7th century were transcribed by characters representing MC nasal initials. These data are neatly tabulated in Hashimoto 1965:120ff; Hashimoto draws a line between the dates 695-699 and 771 showing that the transcriptions fall into two sharply differentiated groups: before the 8th century, all transcriptions of the Sanskrit voiced non-aspirates were effected using Chinese voiced obstruents, and from that date on, Chinese nasal initials were used.

This discovery led Maspéro to the conclusion that the Cháng-ān nasal initials had developed oc-

clusion; e.g., m > mb, n > nd, ŋ > ŋg. This is tantamount to saying that the nasal initials had developed into prenasalized voiced obstruents (~b, ~d, etc.).

Maspéro also noted that the syllables with nasal initials used to write the voiced non-aspirates of Sanskrit never had nasal codas, whereas Sanskrit nasals were transcribed with syllables with both nasal initials and codas. More precisely (cf. Zhào Yìn-táng 1957), the former group of MC syllables had zero codas while the latter had velar nasal codas.

Now recall what was said at the outset about voiced obstruents in OJ. We see immediate confirmation for both the Asayama-Hamada theory and the refined version of Maspéro's hypothesis in the fact that MC syllables of the first type show up in Kan'on with voiced obstruent initials, while those of the second get Kan'on [m-] and [n-] (Tōdō 1960, summarized in Miller 1967:105). There are, however, a few cases in which Kan'on ~b- regularly appears in place of expected *m-.

For this reason, we checked the attested Go'on and Kan'on renderings of every Chinese character which had a MC reading of the form [m___ŋ]. We found that the Sino-Japanese readings varied with the MC finals, and therefore tabulate the Go'on and Kan'on below according to MC syllable types. All the MC forms are from Stimson 1966; all Japanese readings that we include are found in compounds attested in Kōjien.

Type	MC Form Ø-medial	Go'on	Kan'on	MC Form i-medial	Go'on	Kan'on
m+ŋ	[muŋ]	mou	mou			
meŋ				[mieŋ]	myau	mei
məŋ	[məŋ]			[mi̯əŋ]		
mɛŋ	[mɛŋ]			[mi̯ɛŋ]	myau	mei
mæŋ	[mɐŋ]	myau	mau	[mi̯ɐŋ]	myau	mei
maŋ	[mɑ̆ŋ]	mau	~bau			
mɑŋ	[mɑŋ]	mau	~bau	[mi̯aŋ]	mau	~bau

Here we notice that all the exceptional Kan'on initials are followed by [-au]. Considered together with the Go'on forms, there are three types of Kan'-on with that vocalism: 1) Go'on myau : Kan'on mau;

2) Go'on mau : Kan'on ~bau (MC Ø-medial); and 3) Go'on mau : Kan'on ~bau (MC i-medial).

Now the type 3 forms correspond to MC syllables whose initials began to dentilabialize around the time of the Kan'on borrowings. We know that dentilabialization had taken place at least by the 10th century because of documents attributed to the monk Shǒu Wēn which date from that time (Zhào Yìn-táng 1957:41ff). In the 8th century, there were no phonemically distinct dentilabials, but we know that there must have been phonetic differences as early as that time because of the Tibetan transcriptions: all five sources transcribe the MC m-initials which dentilabialize as [hb] according to Hashimoto 1965:175.

We claim, then, that the type 3 Kan'on initials reflect a change which occurred in the Cháng-ān dialect of MC. This leaves only type 2 Kan'on syllables unexplained since MC [maŋ] did not develop dentilabial initials. Because there could have been no differences in the Chinese here, the original Kan'on borrowing must have been *[mau]. This conclusion is strengthened by the fact that the dental nasal initials in [naŋ]-forms (e.g., 暴) yield Kan'on [nau], not *[~dau]. Retabulating the three form types, we get:

	Go'on	Kan'on
1.	myau	mau
2.	mau	*mau > ~bau
3.	mau	~bau

When we consider that type 2 cases are rarer than type 3, and that type 2 cases would have been the only ones with identical Go'on and Kan'on, it is easy to see how analogical pressures could have arisen.

Having established our two preparatory claims, we can now examine the implications of the MC data for OJ and pre-OJ.

It is evident, on the one hand, that the "shift" of Go'on nasal initials to Kan'on prenasalized voiced stops was due to a change in the articulation of the corresponding initials in Chinese over time and space; on the other hand, there is clearly no change in the nature of the MC initials that correspond to Go'on voiced (Kan'on voiceless) obstruents. Therefore, despite the fact that standard kana orthography makes no distinction between Go'on and Kan'on voiced initials, and thus suggests

that they were pronounced alike from the time of OJ onwards, we are forced to conclude that the original Go'on voiced initials were phonetically different from their later values. For, given that some Kan'on morphs had prenasalized voiced initials, it is impossible that the change between 6th and 8th century Japanese responsible for the different outcomes in Go'on and Kan'on for the same Chinese words was simply the introduction of the constraint against word-initial prenasalized voiced obstruents observed among native OJ morphemes. Insofar as the MC initials corresponding to the Go'on initials were, phonemically, voiced obstruents, we must conclude that the original Go'on initials were [b, d, g, z] and that they only later became [ᵐb, ⁿd, ᵑg, ⁿz].

We shall now demonstrate that, in fact, proto-J, the latest reconstructable language that accounts for all recorded dialects down to the present, must have had /b/ and /d/ different from the underlying representations of [ᵐb] and [ⁿd] respectively; to do so, we assume the contrary and show that this leads to intolerable consequences.

Now recall what was said at the beginning of this paper about OJ [w-] and [y-]. We shall prove that proto-J must have had phonemes /w/ and /y/ at least word-medially by giving counterexamples to the only possible argument in favor of non-phonemic medial glides. This argument goes as follows: from our earliest records on, wu/u and yi/i distinctions are not made orthographically, but verb paradigm-fragments kuu/kuwe, kuyu/kui and the like indicate that non-initial orthographic u and i represent [wu] and [yi] (for, aside from these cases, all native surface forms are composed of moras of the shape CV, C = ∅ / #___ optionally); this, together with the fact that the medial glides are comparatively rare in OJ to begin with, suggests that all [w] and [y] in non-initial moras have either been introduced epenthetically, depending on whether they are preceded by /u/ or /i/, or were originally initial in an affixed morpheme. There are, however, a sufficiently large number of cases in which neither of the two conditions just stated occur to refute this claim; e.g.,

aya "pattern"	awa "bubbles, foam"
puye "flute"	pwiwe "whispering"
tuyu "dew"	kowe "voice"
poyo "mistletoe"	siwa "wrinkles"
saye "sprout"	towo "ten"

(All the examples here are attested in man'yō-gana in Igarashi 1969.)

Now then, either we must say that /w/ and /y/ occurred only word-medially and that word-initial [w] and [y] arose from the same /b/ and /d/ which became [b] and [d] elsewhere, or that /b/ and /d/ occurred in all positions but were alternatively relaized in medial position as glides or prenasalized voiced obstruents according to some phonological criterion. We are forced into this position by considerations of complementary distribution, systematic economy, and our initial assumption. The second alternative can be thrown out because there is simply no conditioning criterion to be seen. As for the first, it has several defects: it is suspect first of all because it buys universal distribution for /b/ and /d/ at the expense of a more or less ad hoc constraint against word-initial /w/ and /y/. Secondly, it provides absolutely no insight into why surface voiced obstruents should be prenasalized. Third, it is rather implausible phonetically since the observed tendency in Japanese is for stops to weaken word-medially more than word-initially. Thus,

OJ pana > ɸana (Heian) > hana (modern),

OJ kapa > kaɸa (Heian) > kawa (modern).

Of course, the real coup de grâce to our initial assumption comes from the arguments in favor of deriving all OJ voiced obstruents from complex underlying representations. We now present new data which strangthens those arguments by showing that the distribution of voiced obstruents in OJ is "accent-like."

We begin by considering the work of Benjamin Lyman (1894; see Martin 1952:48f) on voiced obstruents in modern Japanese. "Lyman's Law" states that, given morphemes A and B (from the native lexicon) such that the initial of B is a voiceless obstruent, that initial will not be voiced in composition if B contains a voiced obstruent. This rule seems to apply to all known stages of Japanese. What we will presently show is that a stronger claim can be made for OJ, viz., that the initial of B will not be voiced in composition also if A contains a voiced obstruent.

Our proof goes as follows: we first extract all words attested entirely or partially in man'yō-gana in the major works of the OJ corpus which

are traditionally said to contain two or more voiced obstruents. For this purpose, we use Igarashi 1969. Of the 66 such words, we consider only those in which A contains a voiced obstruent, and B has a voiced obstruent initial. These 26 items are then divided according to the following criteria: 1) is there evidence for one of the voiced obstruents coming from a contraction? 2) is there an ongana or kungana which is said to be voiced, but is actually ambiguous in the man'yō-gana system? 3) is the invariant particle ga present? 4) can one of the crucial morphemes be divided up? The results of this analysis are given in the chart below; the mark "." denotes certain morpheme-boundaries.

asa.pādā.ga.tomo 3
asā.gapō.ga.pana 3
asā.gwirī.gomori 1,2 (˜go =其)
    cf. asā.gwiri.no, a common makura-kotoba
āzirō.gwi 2 (˜gwi = 木)
āzirō.bito 2 (˜bito = 人)
āburā.bwi 2 (˜bwi = 火)
īdutyē.bunye 1
    cf. īdutye.no.punye
irāgǭ.ga.sima 3
ūdī.gapa 2 (˜ga = 可 in Shiki; ˜gapa =河 in Man.)
ūdǭ.bye.no.usi.maro 2 (˜dǫ = 度)
oki.tu.nāgisā.bikǫ.no.kamwi 4
omotakābūda 2 (˜da =馬太)
kāgǭzi.mono 2 (˜gǫ = 児 in Man. 9.1790, = 胡 in Man. 20.4408)
kasū.gā.bye.no.kimi * (˜ga here is "day, sun")
sīdā.gusa 2 (˜gusa = 草)
si.nāgā.dori 2,?3 (˜dori = 鳥; perhaps sinā.ga in the correct analysis)
nāgādi 1 (< nāga.miti)
nāgwī.gapa 2 (whole word = 名木河)
nā.dukī.da 2 (˜da = 田)
nīgisī.gapa 2 (˜ga = 河)

nõ.zimã.ga.saki 3
pirãbũ.gapi 2,?4 (˜gapi = 貝)
pũdĩ.dura 2 (˜dura = 葛)
pye.tu.nãgisã.bikǫ.no.kamwi 4
yapyẽ.gumõ.gakuri 2 (whole word = 八重雲隠)
waka.yama.tonyekǫ.pikǫ.opõ.bĩbi.no.mikoto *

Assuming that the nãgisa in the twin gods' names can be divided (two possible etymologies are suggested in Daigenkai), only the two items marked * do not fall under one of the four criteria; however, one case involves ˜bye, an invariant suffix meaning "guild," and the other (a deity name) contains an apparent reduplication. Reduplications are notoriously liable to violate surface constraints in Japanese (Martin, personal communication); e.g., modern haha "mother" for expected *hawa.

In short, there are no solid cases of an OJ word attested in unambiguous phonograms in a major work which contains two voiced obstruents in such a pattern as to contradict our "strong rule" for voicing in composition.

Excluding for the moment cases of contraction, we might say, in light of the above demonstration, that OJ voiced obstruents were phonologically /p, t, k, s/ preceded by some sort of syllable-boundary mark. Such a mark would be similar to the kudarime ("⌉") of modern Tokyo dialect in that it would not precede the first mora of a native nominal or verbal, and would occur at most once per morpheme; though OJ additionally had a distinctive agarime ("⌈"), its kudarime was constrained in just this way (Okuda 1971:61ff). Here we see the fundamentally "accent-like" characteristic spoken of earlier. Given our "mark," our "strong clause" revision of Lyman's Law means in effect that it must follow the last mora of the A morpheme if voicing is observed; Lyman's Law proper can now be interpreted as a rule which says "cancel all but the rightmost 'mark' within a word." This leaves open the possibility that voicing will not be observed even if neither A nor B contains a voiced obstruent, which is exactly the sort of leeway an adequate theory would need in view of such OJ pairs as yama.sita : yamã.bito (AB : AC) and yamã.bito : uma.pito (AB : CB).

One approach to investigating this hypothesis would be to ask questions like "are there any morphemes which don't voice after yama which are not

themselves followed by morphemes with voicing in most cases of composition?" Since the OJ corpus may leave gaps in the resultant "chains" of examples, we might have to use Early Heian lexical sources here. Another method would be to look for a direct correlation with reconstructed pitch-accent in OJ. In either case, there is always the possibility that a more complicated rule than the proposed Left Cancellation might be discovered, but it is doubtful that the whole idea could be refuted. There is, for example, the question of the rôle played by the OJ agarime; also, a spot-check of Igarashi 1969 has revealed no cogent counterexamples.

Though more research is clearly called for, we feel that the data just presented should at least dispel any pessimism about an eventual proof that no OJ surface voiced obstruent has a single-segment underlying representation (i.e., is a unitary phoneme).

In sum, then, we must concede that our initial assumption in the indirect proof was wrong: /b/ and /d/ must be the source of all OJ [w] and [y] (initial and medial). Given this much, it would be odd if there were no proto-J /g/ and /z/ as well; not only is there an argument from symmetry, but, more importantly, we have the so-called ko-otsu (hereafter A-B) "vowels" of OJ which necessitate postulating proto-J consonants with zero realization in OJ. Without such proto-consonants, analysis of the A-B phenomenon and the closely allied problem of OJ verb inflection becomes somewhat strained.

We refer here to Unger 1971; the position taken there regarding OJ vocalism may be recapitulated as follows:

OJ A-type i-ending moras = [Ci]
B-type i-ending moras = [Cwi]
other i-ending moras = A-type

OJ A-type e-ending moras with velar initials
and
B-type e-ending moras with labial initials = [Ce]

B-type e-ending moras with velar initials
and
A-type e-ending moras with labial initials = [Cye]

other e-ending moras = [Cye]

OJ B-type o-ending moras = [Co]
A-type o-ending moras = [Cwo] or [Cow]*
other o-ending moras = B-type

*written Cǫ for the sake of convenience

It was proposed that all types of e, B-type i, and A-type o be derived from diphthongs; since all OJ morphemes are composed of moras of the shape CV (C = Ø / #___ optionally), it was thought that such diphthongs could only arise from strings of the type /ayi, iyi, oyi, uyi, awu/ through loss of glides before homorganic vowels. If, however, /w, y/ and zero result from older /b, d, g, z/, we see that we have access to all sixteen possible pairs of the four underlying vowels /a, i, u, o/.

The four pairs /aa, ii, uu, oo/ may be regarded as sources for surface [a, i, u, o]; intramorphemically, four more pairs, /ao, oa, uo, ou/, should not occur on account of Arisaka's Law (Unger 1971:556f). This leaves the following diphthongs, all of which can be readily accounted for (Ōno 1953 and personal communication to Hattori, in Hattori 1962; Yamaguchi 1971:11, exs. 1-7):

ai > B-type e

oi > B-type e or B-type i depending on the OJ accent.[1]

ui > B-type i

ia > A-type e

io > A-type e (another outcome depending on accent?)

iu > (y)i or yu.[2]

au > A-type o

ua > A-type o.[3]

In this scheme, /ia, io/ and /ua/ play a crucial part; the analysis of verb inflection in Unger 1971 was complicated in large measure precisely becuuse such pairs were inadmissible in that system.

Again, it is not possible in this paper to spell out the revisions to Unger 1971 implicit in our new data. Suffice it to say that a superceding article on OJ verb inflection will be forthcoming shortly, and that improvements in the new analysis will more than justify our results here.

If we extend the meaning of the term proto-J to include all subsequent dialects until the changes /b/ > /w/, /d/ > /y/, and /g, z/ > Ø were completed in the ancestor of OJ, and define pre-OJ as that ancestor language after these changes had taken place, then the date of the establishment of the Go'on marks a point in time close to the end of

the proto-J period, and the changes are dated to roughly the 7th century. We believe that the MC data and internal Japanese evidence discussed in this paper strongly testify to this conclusion.

One final point, however, deserves comment: why did the /b, d, g, z/ initials of the original Go'on acquire nasal onsets? The simplest explanation---that Go'on morphs formed a distinct lexical stratum, were therefore not necessarily susceptible to sound changes taking place in native morphemes, and, moreover, were especially resistant to surface alteration---is well supported by our historical information about the period in question. The use of Go'on words was socially bounded by their association with Buddhist texts and literacy in general---this point is beyond dispute. Linguistically too, Go'on were clearly distinct from native morphemes: they could have uncontracted diphthongs, palatalized consonants before /a/, etc. Furthermore, the value attached to Go'on in proto-J and pre-OJ was a function of the extent to which they could be relied upon as accurate approximations of contemporary capital dialect Chinese: Kan'on superceded Go'on in the secular sphere precisely because they better fulfilled this requirement by the 8th century; indeed, the fact that Go'on survived more than marginally in the Buddhist establishment shows not only that they had acquired a sort of mantra status by the time of the introduction of Kan'on, but also that, in general, their users attached great importance to preserving them in as uncorrupted a form as possible. In short, the plain voiced initials of Go'on acquired nasal onsets precisely because that was the least accommodation they could make to surface changes in the native vocabulary.

NOTES

[1] For reconstruction of OJ accent, see Okuda 1971. Cf. the difference in modern Tōkyō accent-class of verbs like okiru (i.e., descendants of OJ thematics in -(w)i < -oi) and yoseru (i.e., descendants from OJ thematics in -(y)e < -oi): o⌈ki⌉ru : yo⌈seru. Modern se "back" < sye < *soi and toneri "servant" < tonyeri < tono "household" + iri "member" incidentally contrast in accent with te "hand" < tye < *tai and me "eye" < mye < OJ me < *mai, etc.

[2] This proposal is new. Cases of (y)i-/yu- alternation are well known: iku/yuku "go," i "sleep" : yume "dream" (= "sleep" + "eye").

[3] The fairly large number of yodan and shimo-nidan verbs ending in -opu suggests that this rule is correct; cf. yodan -apu, intensive auxiliary verb.

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